PRAXSYM | *PST*

22dBm CW Test Transmitter

User's Manual

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PRAXSYM warrants that all items will be free from defects in material and workmanship under use as specified in this guide for a period of one year from date of delivery. PRAXSYM further agrees to repair or replace, at its discretion, any failure which upon PRAXSYM's inspection appears to be a result of workmanship or material defect. In no case, shall PRAXSYM's liability for breach of warranty exceed the purchase price of the items in question. PRAXSYM's liability on any claim of any kind, for any loss connected with, or resulting from the use of, performance or breach thereof, installation, inspection, operation or use of any equipment furnished by PRAXSYM, shall in no case exceed the purchase price of the goods which give rise to the claim.

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1.0 Introduction

1.1 Overview

The PST is a portable CW test source capable of transmitting test signals in two bands simultaneously. The output from each band can be enabled independently and level can be adjusted between 0 dBm and +22 dBm in 0.1 dB steps.

The transmitter frequency and output level for each channel can be set from the touch keys on the front panel. The transmitter status can easily be monitored from the backlit LCD display. The transmitter also contains a USB interface enabling the user to control the transmitter remotely.

The transmitter can be powered using the internal 6 AA rechargeable batteries for 4-5 hours of operation. The transmitter can be operated indefinitely using the AC/DC wall adapter included.

1.2 Functional Description

The PST will power on to a splash screen with the Praxsym Logo, and immediately proceed to the main operation screen. The previous settings from the last use will be retained. The transmitter will not power on transmitting RF energy, though it may have been powered off previously while transmitting. The PST may safely be powered off in any state using the ON/OFF button.

The PST is configured with channel spacing of many common wireless standards. Once the channel spacing is selected within the Channel Setup menu, the step size may be adjusted from the main operation screen. This function makes stepping across multiple channels quick and easy during testing.

2.0 Operation

2.1 Battery Charging

The PST transmitter is fully operational while the batteries are being charged. Charging can occur whether or not the unit is powered on.

When "batt low" appears in the battery icon, the battery life is nearing its end. The transmitter will shut down soon. Connect the AC/DC adapter (12 V/1.5 A) to the unit's CHARGE jack. Plug the adapter into a wall outlet. An internal battery charger will control and terminate the charging of the 6 NiMH cells within each unit. When beginning a charge cycle with batteries which have been completely depleted, allow about two and a half hours for a full charge to be restored. A top-off charge is recommended immediately before use for maximum battery life.

A flashing red LED indicates a precharge state. Usually it will flash for a few moments and then enter a fast charge state. This precharge state may last up to a few hours with drained batteries and indefinitely if one or more cells have failed. All cells must be replaced in the latter case. When the LED turns green, the batteries are nearly full and enter trickle charge mode. Continuing to charge when the LED turns green for approximately an hour will give maximum battery life. Fully charged batteries will give five hours of use. Also, the battery icon on the display will be completely darkened. Leaving the charger connected to the PST will initiate a new charge cycle once the batteries have discharged. This will occur continually.

Though designed for many recharge cycles, the batteries are user replaceable. Replace the batteries every 2-3 years. Use only Energizer® NH15 AA NiMH rechargeable batteries, as supplied originally. The internal charge circuit will only work with NiMH rechargeable batteries. Attempting to charge other AA battery types such as Alkaline or Lithium Ion will result in damage to the transmitter.

Do not store the transmitter with discharged or failed batteries. Discharged NiMH batteries can leak acid causing damage to the transmitter.

2.2 Keypad Definition

ON/OFF—Turns unit on or off

Numerals 0-9—Enter a new frequency, amplitude level or step size, select corresponding menu item choice where applicable

Numerals 1&2– From the main screen, pressing 1 or 2 will toggle the LCD between channel 1 and channel 2 set up screens. Pressing 1 while on the channel 1 set up screen will toggle the channel 1 output between RF on and RF off. Likewise for channel 2.

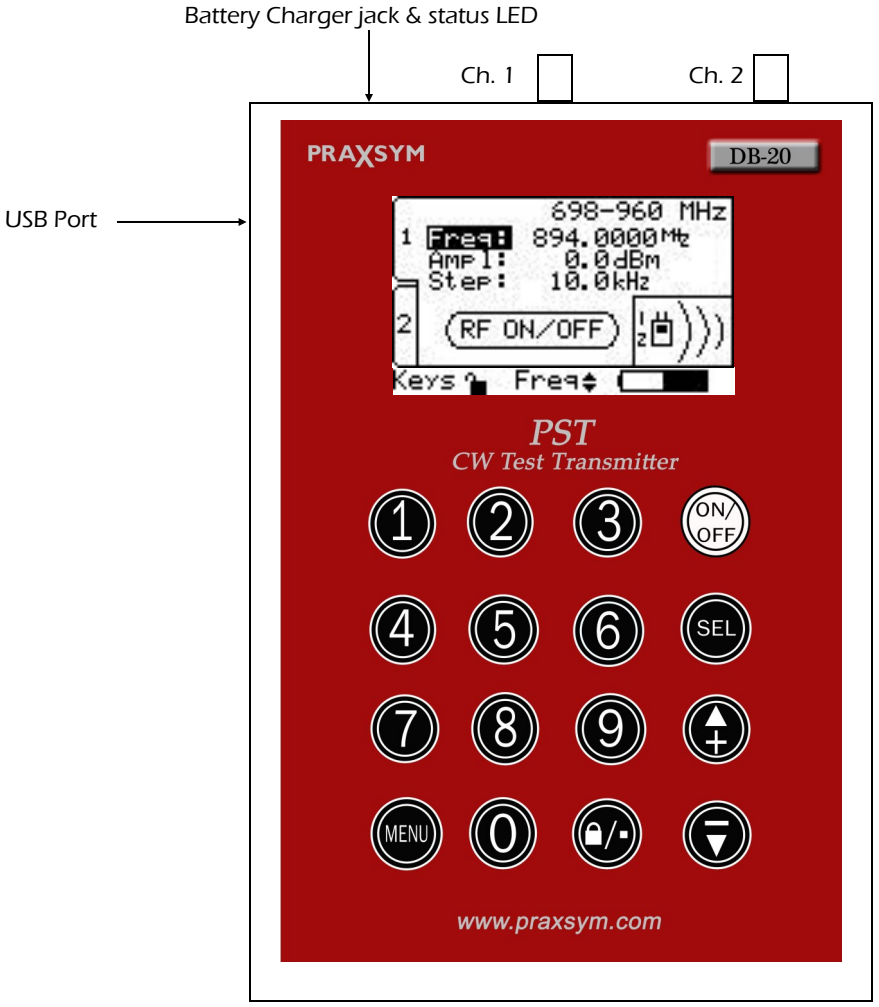
SEL—Select. Toggles between frequency, amplitude, and step size on the main screen or chooses highlighted menu option in applicable screens. Also the same as the "OK" touch screen button.

UP/DOWN ARROWS—Adjust frequency, amplitude or step size of highlighted channel in the main screen using the arrows. Adjustments to frequency are made in the set step size. In applicable sub-menus, the arrows control selection of menu options.

PLUS/MINUS SIGNS— Change to a positive or negative amplitude value

LOCK/DECIMAL POINT–Locks the keypad from any unintentional changes. Indication of lock status is on the display during the main screen only. The keypad may be locked and unlocked from the main operation screen only. The Decimal Point is for use when numerically entering a new frequency, amplitude, or step size.

MENU—This brings up the Main Menu screen from the main operation screen, returns to main screen from Main Menu and backtracks through menus within sub-menu screens.


Battery Charger jack & status LED
Ch. 1
Ch. 2
USB Port
PRAXSYM
DB-20
698-960 MHz
1 Freq: 894.0000MHz
Ampl: 0.0dBm
Step: 10.0kHz
2
RF ON/OFF
Keys
Freq
PST
CW Test Transmitter
1
2
3
ON/OFF
4
5
6
SEL
7
8
9
MENU
0
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2.3 Display Definition

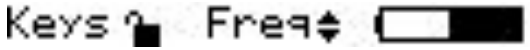
Toggle between active channel screens by touching the tabs on the left side of the screen, the active channel band is noted at the top.

Frequency, Amplitude, and Step size for both channels may be controlled using SEL to change between the three, while the arrow keys make adjustments to the values

Touch screen control of RF transmission

Numbers present indicate channels which are transmitting

Animation will run when either or both channels are transmitting



Lock status of the keypad is Indicated by the padlock icon

Indicates setting which may be adjusted using the arrow keys

Battery Level indicator

To ensure proper care is taken of the touchscreen; avoid leaving the screen exposed to direct sunlight for long periods of time, clean with non-abrasive cloths (microfiber cloth), do not store in temperatures lower than –20°C and higher than 70°C, avoid touching the glass touchscreen with sharp or hard objects.

2.4 Menu Navigation

Pressing the MENU button from the main operation screen brings up the Main Menu. All transmitter settings are available from this menu. Pressing MENU again from this screen returns to the main operation screen.

Using the arrow keys will change the highlighted menu option. SEL chooses the highlighted menu option. Pressing the corresponding menu option on the keypad will also select menu options directly.

The Channel Setup options allow for setting of Frequency, Amplitude and Step Size. Channel Information displaying minimum and maximum values for frequency and RF power output are also available.

Display Settings contains user-selectable parameters for the duration of Backlight Timeout and also Backlight Level brightness.

System Settings contains options to change Baud Rate or Disable/Enable Transmitting when the Frequency is changed. If Disable On New RF is 'ON', the PST will not transmit when a new frequency is entered. If a new step size does not require change of frequency, the PST will continue transmitting.

Pressing the MENU button while in any menu screen will backtrack through the menu hierarchy.

2.5 Controlling the PST Remotely

The PST can be controlled by a PC or embedded controller via the USB interface. Procedures in this section also describe control with terminal emulation software on a PC or laptop computer.

Install the supplied cable between a USB port on the PC/laptop and the USB port on the transmitter.

Start the terminal emulation software and setup with the following parameters.

Baud rate	9600, 38400, or 115200 (user selectable)
Data bits	8
Stop bits	1
Parity	none
Com port	assigned by PC operating system
Local echo	ON

Select line feed (LF) after carriage return (CR) when receiving

The settings may be found in various places depending on the terminal emulation software used. Generally, check the Serial Port and Terminal configuration menus.

Power up the Transmitter by depressing the 'ON/OFF' button. The transmitter frequency is stored in non-volatile memory. When power is applied to the transmitter, it will return to the last entered frequency.

When connecting the transmitter to your PC for the first time, you may need to install the virtual USB-Serial Driver supplied with the Transmitter on the USB Flash Drive. Refer to section 2.6 for driver installation. This driver will already be installed on most PCs with Windows 7 or Windows 8 operating systems.

2.5 Controlling the PST Remotely (continued)

Set up the transmitter, following the recommended sequence:

Set the target channel **CH=X<CR>**

Set the frequency in MHz **FR=XXXX.yyyy<CR>**

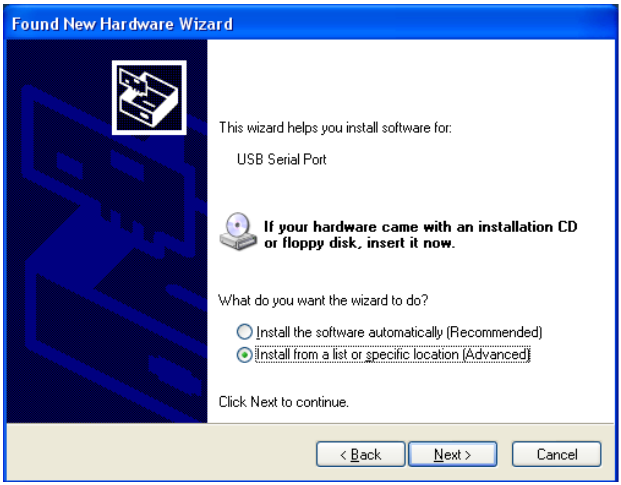
See Section 3.3 for a complete listing of all error responses.

2.6 Installing the USB-Serial Driver

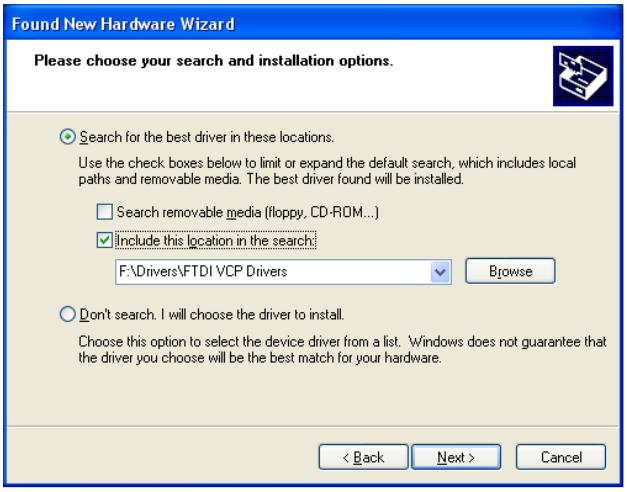
Plug the PST into an available USB port with the supplied cable.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Click 'Next'

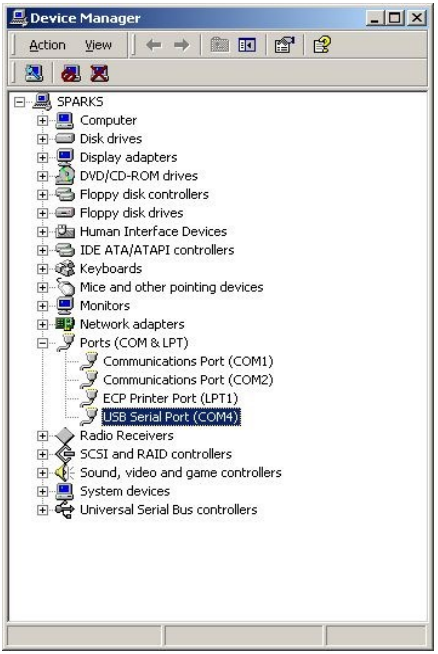

Found New Hardware Wizard
This wizard helps you install software for:
USB Serial Port
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Put the supplied USB Flash Drive into the computer. Select 'Install from a list or specific location (Advanced)' Click 'Next'


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\Drivers\FTDI VCP Drivers
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Leave on the default setting and select 'Include this location in the search' Direct the search path to the 'FTDI VCP Drivers' folder located on the included USB Flash Drive. Click 'Next'

Click 'Finish'



You can now go to the 'Device Manager' and verify the driver was installed successfully. Also note the COM number designated for the USB drivers.

3.0 Serial Interface Operation

3.1 Configuring Tera Term Pro

Open the Terminal setup window from the Setup Menu. Select CR+LF for Receive and CR for Transmit. Enable Local Echo. Also within the Setup menu, choose the Serial Port option. Ensure parameters are matched to what settings were configured within the transmitter for communication.

Tera Term must be closed and the USB cable removed before manually powering down the transmitter.

3.2 Commands

Commands may be sent in lower or upper case. <CR> represents 'ENTER.'

SET COMMANDS

The response to successfully executed SET commands is the message OK <CR>.

FR = XXXX.yyyy<CR> Sets output frequency (in MHz). The Inclusion of the decimal point and digits to the right of the decimal are optional.

CH=X<CR> Sets the channel you wish to configure. X = 1 or 2 *While the display will not change to reflect selection of a different channel with a serial commanded channel change, control of the serially selected channel will function properly

TX=X<CR> Enable/Disable output command. TX=1 turns the output on for the current channel. TX=0 turns the output off for the current channel.

AMP=+/-XX.y<CR> Sets the output amplitude for the current channel.

ST=X.yyyy<CR> Sets the channel spacing (in MHz). Example: ST=0.0125 (12.5 kHz Channel Spacing)

QUERY COMMANDS

FR?<CR> Returns the current frequency setting in the form XXXX.yyyy (MHz).
Example: 950.0000

MN?<CR> Returns the lowest frequency that the currently selected channel can be set in the form XXXX.yyyy (in MHz). See "FR?" for example.

MX?<CR> Returns the highest frequency that the currently selected channel can be set in the form XXXX.yyyy (in MHz). See "FR?" for example.

ST?<CR> Returns the synthesizer step size setting in the form X.yyyy (MHz).
Example: 0.0100

AMP?<CR> Returns the current output amplitude in the form +/- XX.y (dBm) for the current channel.
Example: +5.0

AMN?<CR> Returns the minimum output amplitude in the form +/- XX.y (dBm) that the current channel can output. See "AMP?" for example.

AMX?<CR> Returns the maximum output amplitude in the form +/-XX.y (dBm) that the current channel can output. See "AMP?" for example.

LD?<CR> Returns "0" if the synthesizer for the current channel is unlocked. Returns "1" if the synthesizer for the current channel is locked.

VR?<CR> Returns software version of the receiver board in the form X.yy.
Example: 3.03

VD?<CR> Returns software version of the keypad/display board in the form X.yy.
Example: 1.00

BV?<CR> Returns the battery voltage level "BV=XX.y".
Example: BV=73%

3.3 Error Responses

Invalid commands will be acknowledged with an error response. An error response will consist of 4 ASCII bytes followed by a carriage return. The error code consists of the two characters ER followed by a two-character error status code.

ERIC<CR> Invalid command

The command was not recognized because it was not in the proper format.

ERIN<CR> Invalid number or range

The data included in the previous command was invalid or out-of-range.

4.0 Specifications

4.1 Electrical Specifications

310-010108-012 (N-type)

Channel 1 Frequency	**698-960 MHz**
channel spacing	10, 12.5, 30, & 200 kHz, 1.25 MHz
Channel 2 Frequency	**1710-2170 MHz**
channel spacing	30 kHz, 200 kHz, 1.25 MHz
Output Power	0 to +22 dBm
adjustable	0.1 dBm
Harmonics	< -50dBc

4.2 Environmental Specifications

Temperature Range:	0-50° C

4.3 Mechanical Specifications

RF Connectors:	SMA or N-type
Display:	Transflective 128x64 Black/White White LED Backlight
Keypad:	Sixteen keys – see definition on page 3
Enclosure:	aluminum
Power Source:	6 AA NiMH cells rechargeable
Size:	7″ x 5″ x 2.75″ (excluding RF connectors)
Weight:	4 lbs.

Notes

Notes

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